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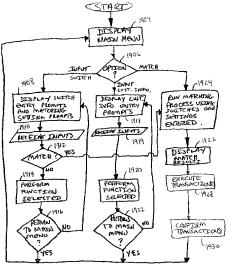
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(54) Title: SYSTEMS AND METHODS FOR MATCHING DESIRED PURCHASES AND SALES OF MIS-MATCHED ITEMS

(57) Abstract: The present invention is systems and methods for matching desired purchases and sales of mis-matched items. These systems and methods compare the requirements of potential buyers and sellers of items against those of sets of other potential buyers and sellers of items to construct transaction sets that will enable an optimal transaction or set of transactions for the parties involved. The present invention may be used to match purchases and sales of any items, such as goods, services, financial instruments, and property interests (e.g., ownership interests in real property, possessory interests in personal property, etc.).

SYSTEMS AND METHODS FOR
MATCHING DESIRED PURCHASES AND
SALES OF MIS-MATCHED ITEMS

Background of the Invention

5          The present invention is systems and methods
for matching desired purchases and sales of mis-matched
items, such as goods, services, financial instruments,
and property interests.

         Frequently, it is desirable to purchase or
10   sell items with particular traits that may not commonly
be found in the open market. Examples of such items
include financial instruments, such as Non-Deliverable
Forward Spreads (NDFSs), Forward Rate Agreements
(FRAs), and Treasury/Agency Bond Swaps, and property
15   interests, such as time-share rights in vacation
properties and airplanes. An NDFS is a contract to buy
one currency on a near date and sell another at a
predetermined forward time on a far date, where the
contract is settled at the maturity time by means of a
20   cash settlement in U.S. Dollars as defined by the
difference between the contract price and the benchmark

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price (or index) that is applicable for that maturity
date.  An FRA is an agreement to borrow or lend
currency on a particular near date in the future for a
predetermined time until a particular far date.

5          As a more particular example, in the case of
a Forward Rate Agreement, a first party may have a near
date of October 13th, a far date of October 27th, an
amount of five million units of appropriate currency,
and a price of 112 total points (i.e., 1.12%), and may

10    desire to minimize the risk associated with that
agreement by making a risk-offsetting agreement.  A
second party may desire to buy an FRA with a near date
of October 13th, a far date of October 15th, an amount
of five million units of the appropriate currency, and

15    a price of 16 total points, and a third party may
desire to buy an FRA with a near date of October 15th,
a far date of October 27th, an amount of five million
units of the appropriate currency, and a price of 96
total points.  In this scenario, it would be desirable

20    to be able to match the buying and selling requirements
of each of the parties so that the desired transactions
could be completed.

          Similarly, consider the case of time-share
rights in a vacation property.  A first party may own

25    the rights to possession of the property from July 1st
through July 15th, and may desire to sell the rights to
that property as a single block.  A second party may
desire to purchase only the rights in that property for
the period from July 1st through July 7th, and a third

30    party may desire to purchase only the rights in that
property for the period from July 8th through July
15th.  In such a scenario, neither the second party nor
the third party may be willing to purchase the rights
in the property for the entire period from July 1st

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through July 15th because it is for more time than each
desires.  Also, in this scenario, the first party may
by unwilling to initially sell the rights in the
property to either the second party or the third party
5   because of a fear that the rights in the property for
the remaining time may hence go unsold.  Thus, because
the desires of the parties are unmatched, none of the
parties can complete the transaction in the property.

Obviously, the examples used to illustrate
10  the matching difficulties in transferring items that
are discussed above are fairly simple, and more complex
scenarios could be contemplated by one of ordinary
skill in the art, for example, such as a hypothetical
case where a set of a dozen mis-matched purchases and
15  sales of FRAs are desired.  In such more complex
scenarios, the principles of the present invention set
forth below are equally applicable.

In view of the foregoing, it is an object of
this invention to provide systems and methods for
20  matching desired purchases and sales of mis-matched
items.


Summary of the Invention

In accordance with the principles of the
present invention, systems and methods for matching
25  desired purchases and sales of mis-matched items are
provided.  These systems and methods compare the
requirements of potential buyers and sellers of items
against those of sets of other potential buyers and
sellers of items to construct transaction sets that
30  will enable an optimal transaction or set of
transactions for the parties involved.  The present
invention may be used to match purchases and sales of
any items, such as goods, services, financial

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instruments, and property interests (e.g., ownership interests in real property, possessory interests in personal property, etc.).

In one embodiment of the present invention, a potential buyer or seller is first asked to identify an item that the party wishes to buy or sell. This identification may include information which can uniquely identify the item, and describe traits and parameters of the item. For example, with an NDFS, the party may identify that the NDFS has a given near date trait, a given far date trait, and a particular market convention parameter. The market convention may be fixing days, settlement days, average days, or any suitable day count convention. The party may also indicate the price parameter (based upon price per day, total bid/offer, or yield curve, for example), the amount parameter, and whether the party intends to buy or sell.

Next the party could indicate customer preferences such as counter-parties with which the customer wishes not to trade, counter-parties with which the customer will only trade, the maximum number of ways in which the customer would like matches to be generated, tolerances on the matching of the prices, whether to limit the matches reported to the party to those with the maximum price benefit to the party, with the maximum amount matching, with the minimum time gaps, or any other suitable preferences.

Then, from the information entered, the systems and methods may generate modified traits for the item. In the example above, this may include dates associated with the NDFS, such as dates for valid business days for the requested market convention. Once this and any other required data is generated, the

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systems and methods may then execute the matching process. In the matching process, traits and modified traits (e.g., buy and sell dates) may be classified into groups (e.g., based upon date position and whether 5 the dates are buy or sell dates), and then sorted. Also, the traits may be converted into other traits to facilitate matching. For example, to facilitate matching between NDFSs with differing date conventions, the present invention may convert the buy and sell 10 dates to dates in a standard convention or to dates in another convention prior to matching. Traits (e.g., buy dates) of items are then matched with corresponding or substantially corresponding traits (e.g., sell dates) of other items, and a list of potential 15 combinations of transaction matches is established to achieve the desired transaction. Finally, the matches may be manually or automatically transacted, and those transactions may be confirmed as having been completed.

Brief Description of the Drawings

20        Further features of the invention, its nature and various advantages will be more apparent from the following detailed description of the preferred embodiments, taken in conjunction with the accompanying drawings, in which like reference characters refer to 25 like parts throughout, and in which:
        FIGS. 1, 3, 9, and 16 are illustrations of switch entry and matching settings displays that may be generated in accordance with certain embodiments of the present invention;
30        FIG. 2 is an illustration of a customer information entry display that may be generated in accordance with one embodiment of the present invention;

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FIGS. 4, 5, 7, 11, and 17 are illustrations of switch listing displays that may be generated in accordance with certain embodiments of the present invention;

5      FIGS. 6, 8, 10, and 12-15 are illustrations of match listing displays that may be generated in accordance with certain embodiments of the present invention;

FIG. 18 is an illustration of a match

10     transaction confirmation display in accordance with one embodiment of the present invention;

FIG. 19 is a flow diagram of a process that may be used to perform the functions illustrated in FIGS. 1-18 in accordance with certain embodiments of

15     the present invention;

FIG. 20 is a flow diagram of a process for matching for proposing items to complete matches (i.e., a solver) in accordance with one embodiment of the present invention;

20     FIG. 21 is a table illustrating a data structure that may be used in a matching process in accordance with one embodiment of the present invention; and

FIG. 22 is a block diagram of a system that

25     may be used to implement the processes and functions illustrated in FIGS. 1-21 in accordance with certain embodiments of the present invention.


Detailed Description of the Preferred Embodiments

The present invention is now described in

30     more detail in conjunction with preferred embodiments which are illustrated in FIGS. 1-22.

Turning to FIGS. 1-18, examples of screen displays that may be presented in certain embodiments

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of the present invention are illustrated.  FIG. 1
illustrates an "Input FRA Switch Deal" window 100.  In
this window, a party can enter information regarding an
FRA switch that the party desires to buy or sell.  As
5   can be seen, this information may include an identifier
102, a customer name 104, whether the party wants to
buy or sell 106, one or more near dates 108, one or
more far dates 110, a currency 112, an amount 114, a
price convention 116, whether the price is based on
10  points per day or total points 118, whether to use a
default price 120, buy and sell prices 122 if a default
price is not to be used, the status 124 of the FRA for
matching (i.e., whether it is available to be matched
(live), no longer available to be matched (pending), or
15  being removed from the matching system (deleted)), and
any comments 126.  Also within window 100, a party can
use buttons 128 to reset or clear window 100, present a
list of FRA switch identifiers for switches entered
into the matching system, insert the display switch as
20  a new switch, modify an entered switch with changes
made in window 100, delete the displayed switch, or
import switch information from another application or a
file.  To get switch information for a particular
switch, a party can search for the switch by entering a
25  switch's identifier in find field 130.  Once found, the
switch's information will be displayed in window 100.

The party can also enter limits for the
matching process, enter filters and settings that
modify how the matches are generated and displayed,
30  initiate the matching process, view switches entered in
the system, and generate switch match reports using a
"Generate FRA Switches List" window 132 that is also
shown in FIG. 1.  Limits may include a range of match
dates 134, a limit on the number of ways matches are

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formed 136, and whether to allow the same party to
participate in a match twice (yes), prohibit the same
party from participating in a match twice (no), or
prohibit the same party from having matching buy and
5    sell dates in a match (mod) 138.  Filters include a
tolerance on the match price 140, whether a minimum
amount per matching transaction is required 142,
whether to exclude certain counter-parties 144, whether
to include only certain counter-parties 146, whether
10   certain other rules 148 apply (such as whether to rank
matches based upon which matches would transact the
maximum amount (maximum amount rule), which matches
involve the maximum number of customers (a maximum
fills rule), which matches give the best price matching
15   (a minimum spreads rule), and which matches give the
largest commission), and whether to solve potential
matches 150 by looking for FRAs that can be created to
enable one or more matches to occur or that can be
created to form a match that will provide a benefit
20   that wouldn't have otherwise existed.  The default buy
and sell prices for those switches that are designated
as using default pricing using entry 120 may be entered
by the operator in field 152.  Matching may be
initiated by pressing button 154.  A list of switches
25   and the corresponding switch information, such as that
displayed in FIG. 5, may be displayed by pressing
button 156.  Finally, a report of switch matches, such
as that in FIG. 6, may be generated by pressing button
158.  Another illustration of these windows is shown in
30   FIG. 3.

        Although not shown in FIG. 1, the present
invention may also enable a party to specify whether
the execution of any proposed matches containing one or
more switches is conditional upon the simultaneous,

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prior, or subsequent execution of proposed matches
containing one or more other switches.  For example, a
party may only be willing to execute matches when at
least five of a set of ten switches that that party
5   would like to match are in fact matched.  In such a
case, when given the option to execute matches, a user
of the present invention may be required to indicate
that that user would like to execute matches containing
all of the required switches before any of matches
10  containing those switches is executed.

        Also, although a particular set of matching
limits, filters, and settings are shown, the present
invention may be implemented with any suitable
additional or alternative limits, filters, and/or
15  settings.

        FIG. 4 shows a partial view of a display of
switches entered into one embodiment of the present
invention.  As can be seen, a summary 400 of the FRA
switch information that was entered into window 100 of
20  FIG. 3 is displayed.  Also, displayed is an indication
of the day count 402 for each price convention given
the appropriate holidays, etc., and a total price 404
given the day count 402 and price 122 for the switch
(FIG. 3).

25       As shown in FIG. 2, an "Input FRA Customer
Info" window 200 is illustrated.  The information
entered in this window may include a customer
identifier 202, a full customer name 204, an
abbreviated customer name 206, a minimum amount of
30  currency per transaction 208, a list of excluded
counter-parties 210 and 212, a status for the customer
214 (active or suspended), a customer contact 216, a
customer phone number 218, and any comments 220.  Using
buttons 222, a party may reset or clear the information

displayed in window 200, enter the information in
window 200 as a new customer, modify an existing
customer with the information displayed in window 200,
delete the customer corresponding to the displayed

5    information, or view a list of customer identifiers.
To retrieve a customer's information, a party may enter
the customer's identifier in field 202 and press the
"Find" hypertext 224.  To return to the display of FIG.
1, a party may press "Go To Switch Match"

10   hypertext 226.

          FIG. 5 shows a more complete view 500 of the
display of switches entered into the embodiment of the
present invention that is illustrated in FIG. 4.  As
shown, four switches 502, 504, 506, and 508 have been

15   entered.  By pressing "MATCH" hypertext 510, a party
can initiate matching on the four switches in the
system.  The party can also delete one or more switches
by selecting the switch in column 518 and pressing
"DELETE" hypertext 512.  The party can sort the list

20   based upon the characteristic in any of the columns
displayed by pressing the corresponding column heading
hypertext 516.  Advanced sorting that may involve
sorting by the characteristics of multiple columns may
be effected by pressing the "ADVANCED SORT"

25   hypertext 514.

          As shown by the arrows 520 displayed in FIG.
5, when matching is performed on switches 502, 504, and
506, these switches will form a transaction match.
This fact is more clearly shown in FIG. 6.  As

30   illustrated, these switches form match "M01" as
indicated in fields 602, 604, 606, and 608.  Column 610
indicates that the switches in match "M01" have a net
price differential of zero because the combined two buy
prices 612 and 614 match the sell price 616.  Also

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shown in FIG. 6 is the fact that switch 618 cannot be
matched with any other of the switches entered into the
matching system.  FIG. 6 further illustrates that after
a match has been transacted, the present invention may
5    confirm the transaction as shown in portion 620.

     FIG. 7 illustrates a larger list 702 of FRA
switches to be matched than that shown in FIG. 5.  Here
the switches indicated by arrows 704, i.e., switches
706, 708, and 710, form a matched set.  As can be seen
10   more easily in FIG. 8, these switches correspond as to
their near and far dates and form a match "M01".  As
indicated in field 802, this match represents an
inverted market because the buyer (switch id. 000235)
is willing to pay more (160) than the total that the
15   sellers (switch ids. 000533 and 000550) are asking for
(144).  When there is such an inverted market, the
present invention may provide the buyer with the
benefit (i.e., give the buyer a price of 144), provide
the sellers with the benefit (i.e., give the sellers a
20   total price of 160), or split the price difference
between the buyer and sellers using any suitable method
(e.g., split the price difference evenly at 152).  The
present invention may alternatively use the value in
the price difference to enable another switch to be
25   added to the match (e.g., by extending the near or far
date on one or more of the switches to allow other
switches to participate in the match).

     As should be clear from the previous example,
the present invention preferably does not require that
30   the total buy and sell prices for the switches to match
in order for a match to be formed.  Nevertheless, the
present invention could be implemented so that price
matching, or matching of any other characteristic of
the items, is required.

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FIG. 9 shows that a new FRA switch entry has
the same parameters except for price as that in switch
id. 000235 shown in FIG. 8.  In this case, the present
invention may determine which FRA switch takes priority
5   when trying to match these switches with other switches
in the matching system.  As shown in portion 1002 of
FIG. 10, the present invention may select switch id.
000235 because the switch has a higher buy price (i.e.,
the buyer is willing to pay more money).  As shown in
10  portion 1004 of FIG. 10, the present invention may also
simply list all of the transaction matches and allow
the user to select the desired match.  As yet another
possibility, the invention may base preference in
selecting switches on order of entry.
15          FIG. 11 shows yet another match list that
could be analyzed by the present invention.  As shown
in FIG. 12, a variety of transaction matches 1202,
1204, 1206, 1208, and 1210 (M01-M05) can be constructed
from this list.  Also shown in column 1212 of FIG. 12
20  are the other matches in which each particular switch
indicated in the corresponding row would be used, and
thus which matches are mutually exclusive.
            Turning to FIG. 13, it can be seen that for
each of the switches with near and far date pairs
25  shown, the number of "fixing days" or day count for the
FRA switches are calculated as 3, 2, and 1 (see column
"DC" 1302 to see that each switch is an "F" type date
convention and column "S/F/B/A" 1304 to see that each
day count is 3, 2, and 1 for "F") for switches 1308,
30  1310, and 1312, respectively.  In these FRA switches,
because the price is set based upon points per day a
per day amount of 8 points, the total price is
calculated as 24, 16, and 8 points, respectively, as
shown in column 1306.  Similarly, in FIG. 14,

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settlement days are used in the date convention shown
in the "DC" column 1402, and accordingly 6, 4, and 2
settlement days for each of switches 1408, 1410, and
1412 are determined as being applicable as shown in
5    column 1404.  Based on these numbers of settlement
days, and the price being set at 8 points per
settlement day, the switches have prices of 48, 32, and
16 points, respectively, as shown in column 1406.
Although the date convention for a matched set can be
10   uniform as shown in FIGS. 13 and 14, the date
conventions can also be entered in mixed formats and
the present invention will calculate the corresponding
prices and forms matches as shown in FIG. 15.
          Turning to FIG. 16, a switch with a default
15   price entry selection is shown.  More particularly, the
switch is designated as using the default system price
by having a check in box 120 of FIG. 16.  When matching
is performed on this switch, the present invention
preferably will retrieve the appropriate price (in this
20   example, the buy price) from the default buy and sell
prices entered in fields 152.  In this way, many
switches that all use a default price could be entered
into a matching system in accordance with the present
invention, and the market price can be easily submitted
25   at the time of matching without having to manually
adjust the price for each switch.  As shown in column
1702 of FIG. 17, when multiple switches are displayed,
each switch could be indicated as using the default
price or not.  In this case, an asterisk is present
30   next to each price that is calculated using the default
price.
          Once a party has viewed the various
transaction matches generated by the present invention,
the party could elect to transact a transaction match

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by clicking on the match id. hypertext 1502 shown in
FIG. 15.   Alternatively, qualifying matches could
automatically be transacted by the present invention
without requiring party intervention.   After a match
5    has been transacted, the customers involved in the
transaction may be automatically notified using any
suitable mechanism, such as email.   Also after the
match has been transacted, the invention may present a
display 1800 such as that shown in FIG. 18.   As
10   illustrated, the matched switches in the match
(switches 1802 and 1804) and a transaction date and
time 1806 may be shown.   A field 1808 may also be
available to document notes relating to the
transaction.   The party may further be given an
15   opportunity to reverse the transaction by selecting
"UNMATCH" hypertext 1810.

          As is evident from the illustrations above,
with certain types of items, such as NDFSs and FRAs,
the present invention can "break up" the legs
20   associated with the items, and then match those legs in
any way.   For example, with an FRA where a party is
obligated to deliver currency on a near date and then
is entitled to receive currency on a far date, and that
party wants to sell the obligations and entitlements
25   under that FRA, the present invention can separate the
obligation to deliver currency from the entitlement to
receive currency.   In such a case, for the obligation
leg, the present invention may simply look for a
corresponding leg in another item where a potential
30   counter-party wants an obligation to deliver currency.
And, for the entitlement leg, the present invention may
simply look for a corresponding leg in the other item,
or in yet another item, where the potential counter-

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party, or any other party, wants an entitlement to
receive currency.

One embodiment of a process 1900 that could
be used to perform the functions illustrated in FIGS.
5    1-18 is shown in FIG. 19.  As can be seen, once process
1900 begins at step 1902, the process displays a main
menu at step 1904.  This main menu may include options
to input a switch, input customer information, and
initiate a matching process.  At step 1906, process
10   1900 determines if any of these options have been
selected, and if so, process 1900 branches accordingly.
If the option to input a switch is selected, the
process branches to step 1908 where switch entry
prompts and matching setting prompts may be displayed.
15   FIG. 1 illustrates an example of a screen that may be
displayed at this point in process 1900.  Next, process
1900 receives inputs at step 1910.  These inputs may
include responses to any of the prompts previously
displayed at step 1908.  At step 1912, the process
20   determines whether matching has been selected, and, if
so, process 1900 branches to step 1924 to perform the
matching process.  If matching has not been selected,
however, process 1900 performs any other functions that
may have been selected at step 1914.  These other
25   functions may include finding a particular switch,
resetting or clearing the prompts, listing entered
switches, inserting a new switch, modifying an entered
switch, deleting an entered switch, importing a switch,
viewing the entered switches, or generating a report of
30   the switches and/or matches.  Once any functions may
have been performed, process 1900 determines at step
1916 whether to return to the main menu or continuing
receiving switch entries and match settings.  If it is
determined at step 1916 that the main menu is to be

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displayed, process 1900 branches back to step 1904.
Otherwise process 1900 branches to step 1908.

    If the option to input customer information
is determined to have been selected at step 1906,

5  process 1900 branches to step 1918 where customer
information entry prompts may be displayed as
illustrated in FIG. 2, for example. Next, at step
1919, process 1900 receives inputs in response to the
prompts displayed in step 1918. Once these inputs have

10  been received, any functions selected in response to
these prompts may be performed at step 1920. Such
functions may include resetting or clearing the prompts
displayed in step 1918, inserting new customer
information, modifying existing customer information,

15  deleting existing customer information, viewing a list
of entered pieces of customer information, and finding
a particular customer's or set of customers'
information. Once this function has been performed,
process 1900 determines whether to return to the main

20  menu at step 1922. If it is determined at step 1922
that the main menu is to be displayed, process 1900
branches back to step 1904. Otherwise process 1900
branches to step 1918.

    Finally, if the option to initiate the

25  matching process is determined to have been selected at
step 1906, process 1900 may branch to step 1924 where
the matching process may be performed as discussed
above in connection with FIGS. 1-18. An example of a
process for matching and for proposing items to

30  complete matches (i.e., a solver) is shown in FIG. 20.
Once the matching process has been completed, the match
results may be displayed at step 1926 as illustrated in
FIGS. 6, 8, 10, and 12-15. After the match results
have been displayed, process 1900 may execute one or

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more of the transaction matches at step 1928. As is stated above, execution may be manually or automatically initiated. Once the matches have been executed, process 1900 may then confirm at step 1930

5    the transactions as shown in FIG. 18. This confirmation may include notifying the party running the matching process and/or the customers to the transaction. Finally, after the transactions have been confirmed, process 1900 may loop back to the main menu

10   at step 1904.

Turning to FIG. 20, a process 2000 for matching and for proposing items to complete matches (i.e., a solver) is shown. As illustrated, at step 2002 items with specific traits and parameters are

15   entered into the matching process. In the case of the items being switches as discussed above, these switches may be entered as shown in FIG. 1, the traits may be near and far dates, and the parameters may be buy/sell intentions for the switches. Next at step 2004, the

20   items are put into a table that is indexed by the traits and parameters. Such a table may be implemented in an SQL database. Next at steps 2006 and 2008, the items are grouped by like items into one or more other tables. Like items include items that may be exchanged

25   for each other. For example, in the case of switches as illustrated above, like items may include switches for corresponding currencies. These steps are preferably performed to speed the subsequent matching process.

30   An illustration of a table 2100 that may be generated through the processing of steps 2004 and 2006 is shown in FIG. 21. As can be seen, table 2100 includes trait and parameter information for eight switches 2101-2108. For each of switches 2101-2108, a

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buy/sell intention parameter ("Buy" or "Sell"), a near
date trait ("N") and a far date trait ("F") are
indicated. As illustrated, the dates are numbered 1-
10. This choice of date designation is merely for
5    purpose of illustation and any suitable date
designation scheme may be implemented in accordance
with the present invention. Also shown is a proposed
switch 2110 that may be used to complete a match of
some of the switches shown in table 2100.

10           Referring back to FIG. 20, process 2000 next
searches through the items in each table for items that
have matching traits but with opposite interest at step
2010. In the case of switches 2101-2108 illustrated in
FIG. 21, this would involve searching through the
15   switches for switches with a matching date designation
but an opposite buy/sell intention. More particularly,
for example, switch 2101 might be matched with switch
2103 because they have corresponding date traits and
opposite buy/sell intentions. When matching first
20   starts, a first item will be selected. That first item
will then be compared to subsequent items with a
matching trait and opposite interest. For example,
switch 2101 would be compared to switches 2103 and 2108
because their near dates match and their buy/sell
25   intentions are opposite. For the comparisons made, the
matching process then looks for other items that can
close the match. For example, with switches 2101 and
2108, the process would then look for one or more
switches to close the far dates on each.

30           In performing steps 2004, 2006 and 2008, and
2010, process 2000 may apply limits to the items
processed at any of these steps to keep processing to a
desired level. As shown with limits 134, 136, and 138
of FIG. 1, such limits may include a range of match

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dates, a limit on the number of ways matches are
generated, and whether to allow same customer matches.
For example, when performing step 2004, process 2000
may only put only switches withing a range of match

5   dates into the initial table.  Alternatively, process
2000 may only apply the range of match dates in
subsequent steps.

Next at step 2012, process 2000 then
determines for each proposed match whether the match

10  was closed.  If so, then at step 2014 an indexed match
table is created for the match.  This match table may
then be available for viewing as shown in FIG. 6 or
processing in order to execute the match transaction.

However, if a match is determined to not be

15  closed at step 2012, then process 2000 proceeds to step
2016 to look for possible solutions to the match.  This
part of the process 2000 implements one embodiment of
the "solver" function of the present invention.  As
shown, at step 2016, process 2000 puts the open match

20  items in an "open" traits table.  Next at step 2018,
the process proposes one or more items to close the
match.  These items will have traits that match other
items in the match that previously only had one trait
matched.  Then process 2000 determines one or more

25  attributes of the proposed item that will make the
match desirable at step 2020.  In order to be
desirable, these attributes should make the match
better in at least one regard than another proposed
match or a closed match stored in a match table at step

30  2014.  Finally, at step 2022, process 2000 presents one
or more proposed matches to a user who can then decide
whether or not to create one of the corresponding items
in order to close the open match.  Each of the proposed

matches may be indicated as having a quality that makes
that match different from another match (e.g., such as
having a higher or lower commission).

5    An example of the processing of the "solver"
portion of the matching process is illustrated in FIG.
21. Referring to switches 2106-2108, it can be seen
that the near dates for switches 2106 and 2108 match
and the far dates for switches 2107 and 2108 match.
The far date of switch 2106 and the near date of switch
10   2107, however, are open. In order to complete the
match, process 2000 may propose creating a switch 2110
to sell with a near date that matches the far date of
switch 2106 and a far date that matches the near date
of switch 2107. In this way, proposed switch 2110
15   could be used to complete the match.

Alternatively or additionally to proposing
switches that could be used to close a match, the
present invention may determine the best available
existing switch that could be used to close the match
20   as much as possible. For example, the invention may
find an existing switch that has a near date that
matches an open far date and a far date that is only
one day off from an open near date.

Once matches are formed, the present
25   invention may apply filters to the matches. As
explained in connection with FIG. 1, these filters may
include requiring a tolerance on the match price, a
minimum amount per matching transaction, an exclusion
of certain counter-parties, an inclusion of only
30   certain counter-parties, ranking matches based upon
which matches would transact the maximum amount,
ranking matches based upon which matches involve the
maximum number of customers, ranking matches that give
the best price matching, and ranking matches based upon

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which matches give the largest or smalles commission or
markup or markdown.

As will be evident to one of ordinary skill
in the art, the present invention can be implemented on

5   a wide variety of computer systems and networks.  In
one embodiment, the present invention could be
implemented on a single computer or processor, wherein
all of the data entry, processing, and display is done
on the single computer or processor.  In other

10  embodiments, the present invention could be implemented
on two or more computers communicating over one or more
computer networks.  These networks could be local area
networks, wide area networks, the Internet, or any
other suitable network.  In such embodiments, the

15  processing may be performed by a server or processor on
the network and the data entry and display may be
performed by computers and/or browsers connected to the
network and in communication with the server or
processor.

20       One example of a system 2200 for implementing
the present invention is shown in FIG. 22.  As
illustrated, system 2200 may include a server 2202 that
is connected by a communication link 2204 to the
Internet 2206 and/or that is connected by a

25  communication link 2212 to an Intranet 2214.  When
implemented with the Internet 2206, one or more web
browsers 2208 may be coupled to server 2204 through the
Internet and communication links 2210.  When
implemented with an Intranet 2214, one or more web

30  browsers 2216 may be coupled to server 2204 through the
Intranet and communication links 2218.

In system 2200, server 2202 may be any
suitable server, processor, computer, or data
processing device, or combination of the same.

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Internet 2206 and Intranet 2214 may be any suitable computer networks and may include any suitable computer network equipment.  Web browsers 2208 and 2216 may be any suitable web browsers or display terminals, and may

5    implemented as software running on general purpose computers, as dedicated hardware, or in any suitable manner.  Finally, communication links 2204, 2210, 2212, and 2218 may be any suitable mechanisms for coupling server 2202 to Internet 2204, Intranet 2214, and/or web

10   browsers 2208 and 2216.  These mechanisms may include dial-up connections, dedicated connections, cable modems, digital subscriber lines, T1 connections, T3 connections, etc.

      It will be understood that the foregoing is

15   only illustrative of the principles of the invention and that various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention, which is limited only by the claims that follow.

What is claimed is:

1.    A method for matching a purchase or sale
of a first item with a respective sale or purchase of a
second item and a third item, wherein each of the first
item, the second item, and the third item has a first
trait and a second trait, the method comprising:

receiving first information relating to
the purchase or sale of the first item, second
information relating to the respective sale or purchase
of the second item, and third information relating to
the respective sale or purchase of the third item,
wherein the first information indicates whether the
first item is to be bought or sold, the second
information indicates that the second item is to be
respectively sold or bought, and the third information
indicates that the third item is to be respectively
sold or bought, and wherein at least one of the first
information, the second information, and the third
information respectively define the first trait and the
second trait of a corresponding at least one of the
first item, the second item, and the third item;

using a processor to determine that the
first trait of the first item substantially corresponds
to the first trait of the second item, and that the
second trait of the second item substantially
corresponds to the first trait of the third item; and

designating the first item, the second
item, and the third item as forming at least a portion
of a transaction match when the first trait of the
first item substantially corresponds to the first trait
of the second item, and the second trait of the second
item substantially corresponds to the first trait of
the third item.

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2. The method of claim 1, wherein the first item, the second item, and the third item are each Forward Rate Agreements, wherein each first trait is a near date, and wherein each second trait is a far date.

3. The method of claim 1, wherein the first item, the second item, and the third item are each Non-Deliverable Forward Spreads, wherein each first trait is a near date, and wherein each second trait is a far date.

4. The method of claim 1, wherein each first trait and each second trait is a date.

5. The method of claim 1, wherein each of the first item, the second item, and the third item is a financial instrument.

6. The method of claim 1, wherein each of the first item, the second item, and the third item is an interest in property.

7. The method of claim 1, wherein at least one of the first information, the second information, and the third information includes at least one parameter, and wherein the method further comprises determining at least one other parameter using the at least one parameter, the first trait, and the second trait for at least a corresponding one of the first item, the second item, and the third item.

8. The method of claim 7, wherein the at least one parameter includes a date convention, and the at least one other parameter includes a day count.

9.    The method of claim 1, wherein at least one of the first item, the second item, and the third item has a prohibition against being bought from or sold to at least one specified party, and wherein at least one of the first item, the second item, and the third item is not designated as forming part of the transaction match when the transaction match would violate the prohibition.

10.    The method of claim 1, wherein at least one of the first item, the second item, and the third item has a requirement of only being bought from or sold to at least one specified party, and wherein the at least one of the first item, the second item, and the third item is not designated as forming part of the transaction match when the transaction match would violate the requirement.

11.    The method of claim 1, wherein at least one of the first item, the second item, and the third item has a requirement of only being bought or sold as at least a minimum amount, and wherein the at least one of the first item, the second item, and the third item is not designated as forming part of the transaction match when the transaction match would violate the requirement.

12.    The method of claim 1, wherein the first trait and the second trait of each of the first item, the second item, and the third item define limits of ranges associated with the first item, the second item, and the third item, and wherein the method further comprises not designating at least one of the first

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item, the second item, and the third item as part of
the transaction match when a corresponding first trait
or second trait is below a lower limit of an acceptable
range for matching.

13.    The method of claim 1, wherein the first
trait and the second trait of each of the first item,
the second item, and the third item define limits of
ranges associated with the first item, the second item,
and the third item, and wherein the method further
comprises not designating at least one of the first
item, the second item, and the third item as part of
the transaction match when a corresponding first trait
or second trait is above an upper limit of an
acceptable range for matching.

14.    The method of claim 1, further
comprising generating transaction matches that include
other items, and limiting the number of transaction
matches that are generated to a specified number.

15.    The method of claim 1, further
comprising not designating the first item, the second
item, and the third item as forming part of the
transaction match when the transaction match would
involve a specified party participating in the
transaction match twice.

16.    The method of claim 1, further
comprising not designating the first item, the second
item, and the third item as forming part of the
transaction match when the transaction match would
involve a specified party purchasing an item having a
first trait that substantially corresponds to a second

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trait of another item being sold by the specified
party.

17. The method of claim 1, further
comprising not designating the first item, the second
item, and the third item as forming part of the
transaction match when the transaction match would have
a net price that is outside a specified tolerance.

18. The method of claim 1, further
comprising determining the first trait and the second
trait of at least one of the first item, the second
item, and the third item in order to form a transaction
match.

19. The method of claim 1, wherein at least
one of the first item, the second item, and the third
item uses a default price, and wherein the method
further comprises applying the default price to the at
least one of the first item, the second item, and the
third item when designating the first item, the second
item, and the third item as forming at least a portion
of the transaction match.

20. The method of claim 1, further
comprising generating a second transaction match that
is at least in part formed from a fourth item and at
least one of the first item, the second item, and the
third item, and indicating which of that the
transaction match and the second transaction match are
mutually exclusive.

21. The method of claim 20, further
comprising removing the transaction match from a set of

- 28 -

matches that are available to be transacted if the second transaction match is transacted.

22. The method of claim 20, further comprising removing the second transaction match from a set of matches that are available to be transacted if the transaction match is transacted.

23. The method of claim 1, wherein a price associated with the first item does not match another price associated with both the second item and the third item, and wherein the method further comprises selecting a match price that is equal to the price associated with the first item.

24. The method of claim 1, wherein a price associated with the first item does not match another price associated with both the second item and the third item, and wherein the method further comprises selecting a match price that is equal to the other price associated with both the second item and the third item.

25. The method of claim 1, wherein a price associated with the first item does not match another price associated with both the second item and the third item, and wherein the method further comprises selecting a match price that is between the price associated with the first item and the other price associated with both the second item and the third item.

26. The method of claim 1, wherein the first trait and the second trait of one of the first item,

the second item, and the third item matches a first
trait and a second trait of another item, and wherein
the method further comprises selecting one of the other
item and the one of the first item, the second item,
and the third item as to be restricted from the
transaction match.

27.    The method of claim 26, wherein the
selecting is based upon an order of entry of the other
item and the one of the first item, the second item,
and the third item.

28.    The method of claim 26, wherein the
selecting is based upon which of the other item and the
one of the first item, the second item, and the third
item has a better price.

29.    A system for matching a purchase or sale
of a first item with a respective sale or purchase of a
second item and a third item, wherein each of the first
item, the second item, and the third item has a first
trait and a second trait, the system comprising:
            a processor that:
            receives first information relating to
the purchase or sale of the first item, second
information relating to the respective sale or purchase
of the second item, and third information relating to
the respective sale or purchase of the third item,
wherein the first information indicates whether the
first item is to be bought or sold, the second
information indicates that the second item is to be
respectively sold or bought, and the third information
indicates that the third item is to be respectively
sold or bought, and wherein at least one of the first

information, the second information, and the third
information respectively define the first trait and the
second trait of a corresponding at least one of the
first item, the second item, and the third item,

        determines that the first trait of the
first item substantially corresponds to the first trait
of the second item, and that the second trait of the
second item substantially corresponds to the first
trait of the third item, and

        designates the first item, the second
item, and the third item as forming at least a portion
of a transaction match when the first trait of the
first item substantially corresponds to the first trait
of the second item, and the second trait of the second
item substantially corresponds to the first trait of
the third item.


        30.  A method for matching a purchase or sale
of a first item with a respective sale or purchase of a
second item, wherein each of the first item and the
second item has a first trait and a second trait, the
method comprising:

        receiving first information relating to
the purchase or sale of the first item and second
information relating to the respective sale or purchase
of the second item, wherein the first information
indicates whether the first item is to be bought or
sold and the second information indicates that the
second item is to be respectively sold or bought,
wherein at least one of the first information and the
second information respectively define the first trait
and the second trait of a corresponding at least one of
the first item and the second item, and wherein at

least one of the first information and the second information includes at least one parameter;

using a processor to determine at least one other parameter using the at least one parameter, the first trait, and the second trait for at least a corresponding one of the first item and the second item;

using the processor to determine that the first trait of the first item substantially corresponds to the first trait of the second item; and

designating the first item and the second item as forming at least a portion of a transaction match when the first trait of the first item substantially corresponds to the first trait of the second item.
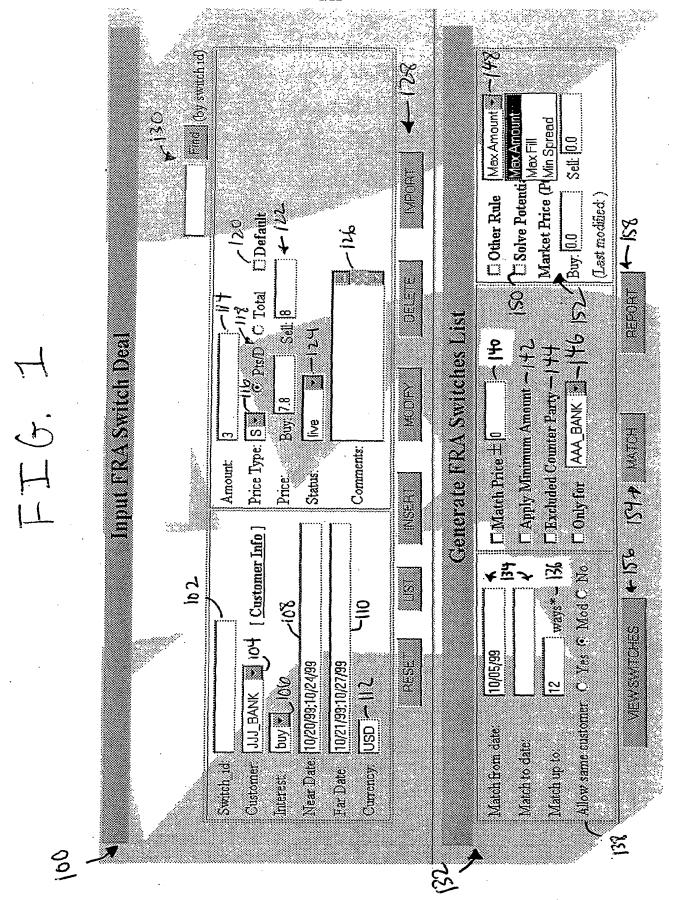
31.    The method of claim 30, wherein the at least one parameter includes a date convention, and the at least one other parameter includes a day count.

32.    A method for matching a purchase or sale of a first item with a respective sale or purchase of a second item, wherein each of the first item and the second item has a first trait and a second trait, the method comprising:

receiving first information relating to the purchase or sale of the first item and second information relating to the respective sale or purchase of the second item, wherein the first information indicates whether the first item is to be bought or sold and the second information indicates that the second item is to be respectively sold or bought, wherein at least one of the first information and the second information respectively define the first trait

and the second trait of a corresponding at least one of the first item and the second item, and wherein a price associated with the first item does not match another price associated with the second item;

using a processor to select a match price that is equal to one of the first price, the second price, or a price between the first price and the second price;

using the processor to determine that the first trait of the first item substantially corresponds to the first trait of the second item; and

designating the first item and the second item as forming at least a portion of a transaction match when the first trait of the first item substantially corresponds to the first trait of the second item.
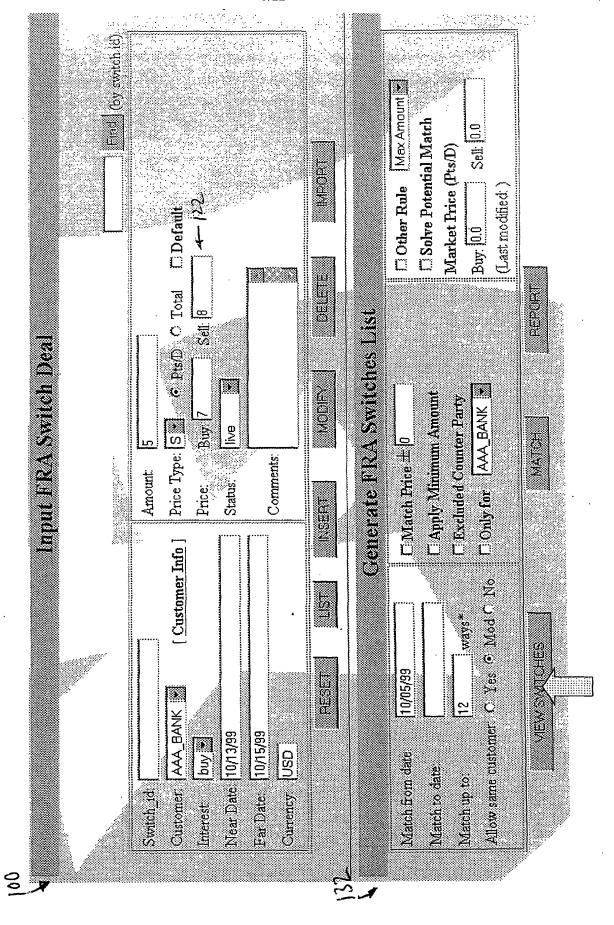
33.    A method for matching a purchase or sale of a first item with a respective sale or purchase of a second item, wherein each of the first item and the second item has a first trait and a second trait, the method comprising:

receiving first information relating to the purchase or sale of the first item and second information relating to the respective sale or purchase of the second item, wherein the first information indicates whether the first item is to be bought or sold and the second information indicates that the second item is to be respectively sold or bought;

using a processor to determine the first trait and the second trait of at least one of the first item and the second item;

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using the processor to determine that
the first trait of the first item substantially
corresponds to the first trait of the second item; and
designating the first item and the
second item as forming at least a portion of a
transaction match when the first trait of the first
item substantially corresponds to the first trait of
the second item.

# FIG. 1



**Input FRA Switch Deal**

160

102

Switch_id
Customer: JJJ_BANK — 104 [ Customer Info ]
Interest: buy — 106
Near Date: 10/20/99;10/24/99 — 108
Far Date: 10/21/99;10/27/99 — 110
Currency: USD — 112

Amount: 3 — 114
Price Type: S — 116    Prs/D    Total — 120
Price: Buy 7.8 — 118    Sell 8 — 124    Default — 122
Status: live — 124
Comments: — 126

130 — Find (by switch id)

128

RESET    LIST    INSERT    MODIFY    DELETE    IMPORT

**Generate FRA Switches List**

132

Match from date: 10/05/99 — 134
Match to date: — 136
Match up to: 12    ways* — 136
Allow same customer:  Yes  Mod  No

Match Price ± 0 — 140
Apply Minimum Amount — 142
Excluded Counter Party — 144
Only for AAA_BANK — 146    152

150

156 — VIEWSWITCHES    154 — MATCH    REPORT

Other Rule    Max Amount — 148
Solve Potenti    Max Amount / Max Fill
Market Price (P  Min Spread)
Buy: 0.0    Sell: 0.0
(Last modified: )
158

138

# FIG. 2

## Input FRA Customer Info

customer_id: [000020]  ~202

customer: [JJJ BANK]  ~204

short name: [JJJ_BANK]  ~206

min amount: [2]  ~208

excluded CPty: [BBB_BANK:DDD_BANK]  ~210

[DDD_BANK ▼] [0]  ~212

status: [active ▼]  ~214

contact: [        ]  ~216

phone: [        ]  ~218

comments: [          ]  ~220

[RESET]  [INSERT]  [MODIFY]  [DELETE]  [VIEW LIST]  ~222

~224

Enter "customer_id" and press FIND to get the record for this customer (or a list of similar customers, e.g., CU% matchs all customer_id starts with CU)

[ Go To Switch Match ]  ~226

200

FIG. 3

## Input FRA Switch Deal

Switch_id [                    ]

[ Customer Info ]

Customer:  [AAA_BANK ▼]

Interest:  [buy ▼]

Near Date:  10/13/99

Far Date:  10/15/99

Currency:  [USD]

Amount:  [5        ]

Price Type:  [S ▼]  ⦿ Pts/D  ○ Total  ☐ Default  ← 122

Price:  Buy: [7    ]  Sell: [8    ]

Status:  [live ▼]

Comments:  [                    ]

[RESET]  [LIST]  [INSERT]  [MODIFY]  [DELETE]  [IMPORT]

## Generate FRA Switches List

Match from date  10/05/99

Match to date  [          ]

Match up to:  [12    ]  ways*

Allow same customer:  ○ Yes  ⦿ Mod  ○ No

Match Price ± [0    ]

☐ Apply Minimum Amount

☐ Excluded Counter Party

☐ Only for  [AAA_BANK ▼]

☐ Other Rule  [Max Amount ▼]

☐ Solve Potential Match

Market Price (Pts/D)

Buy: [0.0  ]    Sell: [0.0  ]

(Last modified: )

[VIEW SWITCHES]  [MATCH]  [REPORT]

100

132

FIG. 4

[ Go To Home]   [ MATCH ]   [ DELETE ]

Found 4 switches in the database.

Select the switch from the list or press Back button on your browser to return to previous page.

Click on header to sort or press ADVANCED SORT to sort by multiple columns.

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS |
|-------|----------|-----|-----------|----------|-----|-----|---------|-----|-----|-----|--------|----------|
| 000232 | AAA_BANK ☐ | buy | 10/13/1999 | 10/15/1999 | 5 | S | 2/6/2/4 | 14 | USD | 0 | live | |

402   404

400

# FIG. 5

[ Go To Home]  [ MATCH ]  [ DELETE ]

Found 4 switches in the database.

Select the switch from the list or press Back button on your browser to return to previous page.

Click on header to sort or press ADVANCED SORT to sort by multiple columns.

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS |
|-------|----------|-----|-----------|----------|-----|----|---------|----|-----|-----|--------|----------|
| 000232 | AAA_BANK □ | buy | 10/13/1999 | 10/15/1999 | 5 | S | 2/6/2/4 | 16 | USD | 0 | live | |
| 000233 | BBB_BANK □ | buy | 10/15/1999 | 10/27/1999 | 5 | S | 12/12/8/12 | 96 | USD | 0 | live | |
| 000234 | CCC_BANK □ | sell | 10/13/1999 | 10/27/1999 | 5 | S | 14/18/10/16 | 112 | USD | 0 | live | |
| 000235 | AAA_BANK □ | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | live | |

FIG. 6

[ Go To Home ]  [ VIEW ]

Found 1 matches of switches in the database.

Select the match from the list or press Back button on your browser to return to main screen

610

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000212:000233:000234 | M01 | | | | | | | | | | M01 |
| 000232 | AAA_BANK | buy | 10/13/1999 | 10/15/1999 | 5 | S | 2/6/2/4 | 16 | USD | 0 | M01 |
| 000233 | BBB_BANK | buy | 10/15/1999 | 10/27/1999 | 5 | S | 12/12/8/12 | 96 | USD | 0 | M01 |
| 000234 | CCC_BANK | sell | 10/13/1999 | 10/27/1999 | 5 | S | 14/18/10/16 | 112 | USD | 0 | M01 |

The following switches are not matched.

614

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 000235 | AAA_BANK | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | live | |

The following matches are confirmed.

620

| 000030:000098:SWI017:SWI018:SWI023 |
|---|
| 000120:000126 |
| 000125:000201 |

FIG. 7

[ Go To Home ]  [ MATCH ]  [ DELETE ]
Found 4 switches in the database.
Select the switch from the list or press Back button on your browser to return to previous page.
Click on header to sort or press ADVANCED SORT to sort by multiple columns.

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 000235 | AAA_BANK | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | live | |
| 000404 | AAA_BANK | sell | 10/22/1999 | 11/03/1999 | 5 | S | 12/9/7/10.5 | 96 | USD | 0 | live | |
| 000409 | AAA_BANK | buy | 10/19/1999 | 10/29/1999 | 7 | F | 10/12/8/11 | 96 | USD | 0 | live | |
| 000533 | BBB_BANK | sell | 10/14/1999 | 10/18/1999 | 6 | S | 4/6/2/5 | 32 | USD | 0 | live | |
| 000534 | AAA_BANK | buy | 11/03/1999 | 11/09/1999 | 0 | T | 6/7/4/6.5 | 0 | USD | 0 | live | |
| 000539 | CCC_BANK | buy | 10/18/1999 | 10/20/1999 | 5 | S | 2/4/2/3 | 16 | USD | 0 | live | |
| 000540 | CCC_BANK | buy | 10/18/1999 | 10/25/1999 | 5 | S | 7/7/5/7 | 112 | USD | 0 | live | |
| 000541 | CCC_BANK | buy | 10/18/1999 | 11/08/1999 | 5 | S | 21/21/14/21 | 2352 | USD | 0 | live | |
| 000542 | CCC_BANK | sell | 10/20/1999 | 10/28/1999 | 5 | S | 8/8/6/8 | 18816 | USD | 0 | live | |
| 000543 | CCC_BANK | sell | 10/25/1999 | 10/28/1999 | 5 | S | 3/5/3/4 | 56448 | USD | 0 | live | |
| 000544 | CCC_BANK | buy | 10/28/1999 | 11/08/1999 | 5 | S | 11/9/6/10 | 62092 | USD | 0 | live | |
| 000545 | CCC_BANK | sell | 10/20/1999 | 11/03/1999 | 5 | S | 14/11/9/12.5 | 86929 | USD | 0 | live | |
| 000546 | CCC_BANK | sell | 10/25/1999 | 11/03/1999 | 5 | S | 9/8/6/8.5 | 78236 | USD | 0 | live | |
| 000547 | CCC_BANK | buy | 11/03/1999 | 11/08/1999 | 5 | S | 5/6/3/5.5 | 39110 | USD | 0 | live | |
| 000548 | DDD_BANK | sell | 10/18/1999 | 10/26/1999 | 0 | T | 8/8/6/8 | 0 | USD | 0 | live | |
| 000549 | DDD_BANK | buy | 10/26/1999 | 11/01/1999 | 0 | T | 6/6/4/6 | 0 | USD | 0 | live | |
| 000550 | DDD_BANK | sell | 10/18/1999 | 11/01/1999 | 0 | T | 14/14/10/14 | 0 | USD | 0 | live | |

# FIG. 8

[ Go To Home ]   [ VIEW ]

There are 1 switches after applying the following criteria:

*'Match Price'*;

An Inverted Market

In ~ 802

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000235000533000550 → M01 | | | | | | | | | | | |
| 000235 | AAA_BANK | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | M01 |
| 000533 | BBB_BANK | sel | 10/14/1999 | 10/18/1999 | 6 | S | 4/6/2/5 | 32 | USD | 0 | M01 |
| 000550 | DDD_BANK | sel | 10/18/1999 | 11/01/1999 | 5 | S | 14/14/10/14 | 112 | USD | 0 | M01 |

# FIG. 9

## Input FRA Switch Deal

Switch_id:

Customer: EEE_BANK ▼　　[ Customer Info ]

Interest: buy ▼

Near Date: 10/14/99

Far Date: 11/01/99

Currency: USD

Amount: 5

Price Type: T ▼　　○ Pts/D　◉ Total　☐ Default

Price:　Buy: 140　Sell: 140

Status: live ▼

Comments:

RESET　LIST　INSERT　MODIFY　DELETE　IMPORT

Find (by switch id)

## Generate FRA Switches List

Match from date: 10/07/99

Match to date:

Match up to: 12　ways*

Allow same customer: ○ Yes ◉ Mod ○ No

☐ Match Price ± 0

☐ Apply Minimum Amount

☐ Excluded Counter Party

☐ Only for AAA_BANK ▼

☐ Other Rule　Max Amount ▼

☐ Solve Potential Match

Market Price (Pts/D)

Buy: 0.0　Sell: 0.0

(Last modified: )

VIEWSWITCHES　MATCH　REPORT

## FIG. 10

[ Go To Home ] [ VIEW ]
There is 1 switches after applying the following criteria:
'Match Price';

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000235 000533 000550 — M01 | | IA | | | | | | | | | M01 |
| 000235 | A.A._BANK | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | M01 M02 |
| 000533 | BBB_BANK | sell | 10/14/1999 | 10/18/1999 | 6 | S | 4/6/2/5 | 32 | USD | 0 | M01 M02 |
| 000550 | DDD_BANK | sell | 10/18/1999 | 11/01/1999 | 5 | S | 14/14/10/14 | 112 | USD | 0 | M01 M02 |

1002

[ Go To Home ] [ VIEW ]
Found 2 matches of switches in the database.
Select the match from the list or press Back button on your browser to return to main screen

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000235 000533 000550 — M01 | | | | | | | | | | | M01 |
| 000235 | A.A._BANK | buy | 10/14/1999 | 11/01/1999 | 5 | F | 18/20/12/19 | 160 | USD | 0 | M01 M02 |
| 000533 | BBB_BANK | sell | 10/14/1999 | 10/18/1999 | 6 | S | 4/6/2/5 | 32 | USD | 0 | M01 M02 |
| 000550 | DDD_BANK | sell | 10/18/1999 | 11/01/1999 | 5 | S | 14/14/10/14 | 112 | USD | 0 | |
| 000533 000550 000551 — M02 | | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | M01 M02 |
| 000533 | BBB_BANK | sell | 10/14/1999 | 10/18/1999 | 6 | S | 4/6/2/5 | 32 | USD | 0 | M01 M02 |
| 000550 | DDD_BANK | sell | 10/18/1999 | 11/01/1999 | 5 | S | 14/14/10/14 | 112 | USD | 0 | M01 M02 |
| 000551 | EEE_BANK | buy | 10/14/1999 | 11/01/1999 | 5 | T | 18/20/12/19 | 140 | USD | 0 | M02 |

1004

FIG. 11

[Go To Home] [MATCH] [DELETE]

Found 4 switches in the database.

Select the switch from the list or press Back button on your browser to return to previous page.

Click on header to sort or press ADVANCED SORT to sort by multiple columns.

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 000404 | AAA_BANK ☐ | sell | 10/22/1999 | 11/03/1999 | 5 | S | 12/9/7/10.5 | 96 | USD | 0 | live | |
| 000534 | AAA_BANK ☐ | buy | 11/03/1999 | 11/09/1999 | 0 | T | 6/7/4/6.5 | 0 | USD | 0 | live | |
| 000543 | CCC_BANK ☐ | sell | 10/25/1999 | 10/28/1999 | 5 | S | 3/5/3/4 | 24 | USD | 0 | live | |
| 000545 | CCC_BANK ☐ | sell | 10/20/1999 | 11/03/1999 | 5 | S | 14/11/9/12.5 | 112 | USD | 0 | live | |
| 000547 | CCC_BANK ☐ | buy | 11/03/1999 | 11/08/1999 | 5 | F | 5/6/3/5.5 | 45 | USD | 0 | live | |
| 000551 | EEE_BANK ☐ | buy | 10/14/1999 | 11/01/1999 | 5 | T | 18/20/12/19 | 140 | USD | 0 | live | |
| 000552 | FFF_BANK ☐ | buy | 10/26/1999 | 11/01/1999 | 7 | F | 6/6/4/6 | 45 | USD | 0 | live | |
| 000553 | FFF_BANK ☐ | buy | 10/26/1999 | 11/08/1999 | 7 | F | 13/13/8/13 | 104 | USD | 0 | live | |
| 000554 | FFF_BANK ☐ | sell | 11/01/1999 | 11/05/1999 | 7 | F | 4/6/3/5 | 48 | USD | 0 | live | |
| 000555 | FFF_BANK ☐ | buy | 11/05/1999 | 11/08/1999 | 7 | S | 3/1/1/2 | 24 | USD | 0 | live | |
| 000556 | HHH_BANK ☐ | buy | 10/26/1999 | 11/01/1999 | 6 | S | 6/6/4/6 | 54 | USD | 0 | live | |
| 000557 | HHH_BANK ☐ | buy | 10/26/1999 | 11/08/1999 | 6 | S | 13/13/8/13 | 91 | USD | 0 | live | |
| 000573 | BBB_BANK ☐ | buy | 10/27/1999 | 10/29/1999 | 6 | T | 2/2/2/2 | 16 | USD | 0 | live | |
| 000574 | BBB_BANK ☐ | buy | 11/01/1999 | 11/03/1999 | 6 | T | 2/1/1/1.5 | 16 | USD | 0 | live | |
| 000575 | III_BANK ☐ | sell | 11/01/1999 | 11/03/1999 | 5 | T | 2/1/1/1.5 | 15 | USD | 0 | live | |
| 000576 | AAA_BANK ☐ | sell | 11/03/1999 | 11/08/1999 | 5 | S | 5/6/3/5.5 | 40 | USD | 0 | live | |
| 000577 | CCC_BANK ☐ | buy | 11/03/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 45 | USD | 0 | live | |
| 000578 | AAA_BANK ☐ | sell | 11/10/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 80 | USD | 0 | live | |
| 000580 | FFF_BANK ☐ | buy | 11/12/1999 | 11/12/1999 | 5 | F | 2/1/2/1.5 | 8 | USD | 0 | live | |
| 000581 | LLL_BANK ☐ | buy | 11/12/1999 | 11/16/1999 | 5 | F | 4/1/1/2.5 | 45 | USD | 0 | live | |
| 000583 | AAA_BANK ☐ | sell | 11/05/1999 | 11/10/1999 | 5 | S | 5/5/3/5 | 40 | USD | 0 | live | |

# FIG. 12

[ Go To Home]  [ VIEW ]

Found 5 matches of switches in the database.

Select the match from the list or press Back button on your browser to return to main screen

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **000574/000575 → M01** | | | | | | | | | | | | |
| 000574 | BBB_BANK | buy | 11/01/1999 | 11/03/1999 | 6 | T | 2/1/1/1.5 | 16 | USD | 0 | M01 | M04 |
| 000575 | II_BANK | sell | 11/01/1999 | 11/03/1999 | 5 | T | 2/1/1/1.5 | 15 | USD | 0 | M01 | |
| | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | | |
| **000547/000576 → M02** | | | | | | | | | | | | |
| 000547 | CCC_BANK | buy | 11/03/1999 | 11/08/1999 | 5 | F | 5/6/3/5.5 | 45 | USD | 0 | M02 | |
| 000576 | AAA_BANK | sell | 11/03/1999 | 11/08/1999 | 5 | S | 5/6/3/5.5 | 40 | USD | 0 | M02 | M05 |
| **000577/000578 → M03** | | | | | | | | | | | | |
| 000577 | CCC_BANK | buy | 11/03/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 45 | USD | 0 | M03 M04 | M05 |
| 000578 | AAA_BANK | sell | 11/03/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 80 | USD | 0 | M03 | |
| | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | | |
| **000554/000574/000577/000583 → M04** | | | | | | | | | | | | |
| 000554 | FFF_BANK | sell | 11/01/1999 | 11/05/1999 | 7 | F | 4/6/3/5 | 48 | USD | 0 | M04 | |
| 000574 | BBB_BANK | buy | 11/01/1999 | 11/03/1999 | 6 | T | 2/1/1/1.5 | 16 | USD | 0 | M01 | M04 |
| 000577 | CCC_BANK | buy | 11/03/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 45 | USD | 0 | M03 M04 | M05 |
| 000583 | AAA_BANK | sell | 11/05/1999 | 11/10/1999 | 5 | S | 5/5/3/5 | 40 | USD | 0 | M04 | M05 |
| **000555/000576/000577/000583 → M05** | | | | | | | | | | | | |
| 000555 | FFF_BANK | buy | 11/05/1999 | 11/08/1999 | 7 | S | 3/1/1/2 | 24 | USD | 0 | M05 | |
| 000576 | AAA_BANK | sell | 11/03/1999 | 11/08/1999 | 5 | S | 5/6/3/5.5 | 40 | USD | 0 | M02 | M05 |
| 000577 | CCC_BANK | buy | 11/03/1999 | 11/10/1999 | 5 | F | 7/10/5/8.5 | 45 | USD | 0 | M03 M04 | M05 |
| 000583 | AAA_BANK | sell | 11/05/1999 | 11/10/1999 | 5 | S | 5/5/3/5 | 40 | USD | 0 | M04 | M05 |

1202 1204 1206 1208 1210 1212

FIG. 13

[Go To Home]  [VIEW]
There 1 switches after applying the following criteria:
'Sorted by Minimum Spread.'

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000sys:100s%:000sy7 — M01 | | | | | | | | 0 | | | |
| 000595 | HHH_BANK | buy | 10/28/1999 | 11/03/1999 | 10 | F | 6/3/3/4.5/24 | | USD | 0 | M01 |
| 000596 | IJJ_BANK | sell | 10/28/1999 | 11/01/1999 | 10 | F | 4/2/2/3 | 16 | USD | 0 | M01 |
| 000597 | LLL_BANK | sell | 11/01/1999 | 11/03/1999 | 10 | F | 2/1/1/5.8 | 8 | USD | 0 | M01 |

# FIG. 14

[ Go To Home ]  [ VIEW ]

There 1 switches after applying the following criteria:

'Sorted by Minimum Spread.'

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 000595 000596 000597 | M01 | | | | | | | 0 | | | M01 |
| 000595 | HHH_BANK | buy | 10/28/1999 | 11/03/1999 | 10 | S | 6/3/3/4.5 | 48 | USD | 0 | M01 |
| 000596 | JJJ_BANK | sell | 10/28/1999 | 11/01/1999 | 10 | S | 4/2/2/3 | 32 | USD | 0 | M01 |
| 000597 | LLL_BANK | sell | 11/01/1999 | 11/03/1999 | 10 | S | 2/1/1/1.5 | 16 | USD | 0 | M01 |

1402   1404   1406

1408   1410   1412

# FIG. 15

[ Go To Home]   [ VIEW ]

There is 1 switches after applying the following criteria:

'Sorted by Minimum Spread.'

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRICE | CUR | FEE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0045Sx000596x000597 | MOI | | | | | | | -8 | | | |
| 000595 | HHH_BANK | buy | 10/28/1999 | 11/03/1999 | 10 | S | 6/3/3/4.5 | 48 | USD | 0 | M01 |
| 000596 | JJJ_BANK | sell | 10/28/1999 | 11/01/1999 | 10 | S | 4/2/2/3 | 32 | USD | 0 | M4 |
| 000597 | LLL_BANK | sell | 11/01/1999 | 11/03/1999 | 10 | F | 2/1/1/1.5 | 8 | USD | 0 | M01 |

1502

FIG. 16

## Input FRA Switch Deal

Find (by switch id)

Switch_id: 000699
Customer: HHH_BANK   [ Customer Info ]
Interest: buy
Near Date: 10/25/1999
Far Date: 11/08/1999
Currency: USD

Amount: 5
Price Type: S   ● Pts/D   ○ Total   ☑ Default   — 120
Price: Buy: 0   Sell: 0
Status: live
Comments: Transaction will use internernally generated price

RESET   LIST   INSERT   MODIFY   DELETE   IMPORT

## Generate FRA Switches List

Match from date: 10/14/99
Match to date:
Match up to: 12
Allow same customer: ○ Yes ● Mod ○ No   ways*

☐ Match Price ± 0
☐ Apply Minimum Amount
☐ Excluded Counter Party
☐ Only for   HHH_BANK

☐ Other Rule   Max Amount
☐ Solve Potential Match
Market Price (Pts/D)
Buy: 7.5   Sell: 8.5
(Last modified: 3/17 11/20/99)

VIEW SWITCHES   MATCH   REPORT

152

FIG. 17

[ Go To Home ] [ MATCH ] [ DELETE ] [ MODIFY ]

Found 38 switches in the database.
Select the switch from the list or press Back button on your browser to return to previous page.
Click on header to sort or press ADVANCED SORT to sort by multiple columns.

AAA_BANK ▼     live ▼     Set

1702

| SW ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMT | DC | S/F/B/A | PRC | CUR | FEE | STATUS | COMMENTS | USED | DEFAU |
|-------|----------|-----|-----------|----------|-----|------|----------|-------|-----|-----|--------|---------------------------|------|-------|
| 000595 | HHH_BANK ☐ | buy | 10/28/1999 | 11/03/1999 | 10 | S ▼ | 6/3/3/4.5 | 48 | USD | 0 | live ▼ | | 0 | |
| 000696 | HHH_BANK ☐ | buy | 10/14/1999 | 11/01/1999 | 5 | S ▼ | 18/20/12/19 | *135 | USD | 0 | live ▼ | Transaction will use inter | 1 | |
| 000697 | HHH_BANK ☐ | buy | 10/14/1999 | 11/08/1999 | 5 | S ▼ | 25/27/16/26 | *187.5 | USD | 0 | live ▼ | Transaction will use inter | 1 | |
| 000698 | HHH_BANK ☐ | buy | 10/25/1999 | 11/01/1999 | 5 | S ▼ | 7/7/5/7 | *52.5 | USD | 0 | live ▼ | Transaction will use inter | 1 | |
| 000699 | HHH_BANK ☐ | buy | 10/25/1999 | 11/08/1999 | 5 | S ▼ | 14/14/9/14 | *105 | USD | 0 | live ▼ | Transaction will use inter | 1 | |

FIG. 18

[ Go To Home ]  [ VIEW ]
The match 002308:002343 has been confirmed. To rollback this match, press UNMATCH

Match_ID: 002308:002343　DateStamp: 20000104 12:43:32　Notes :

The individual switch in this match will NOT show up for future matching process.
If the match is not filled, you can select the switch id to create a new switch with modified amount.

| SW_ID | CUSTOMER | B/S | NEAR DATE | FAR DATE | AMOUNT | DC | DAYS | PRC | CUR | FEE | STATUS | COMMENTS | USEDEFAULTPRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002308 | BBB_BANK | sell | 01/18/2000 | 01/26/2000 | 5 | S | 8/8/5/8 | 48 | USD | 0 | matched | | 0 |
| 002343 | JJJ_BANK | buy | 01/18/2000 | 01/26/2000 | 2 | T | 8/8/5/8 | 48 | USD | 0 | matched | | 0 |

START ~ 1902

1900

DISPLAY
MAIN MENU ~ 1904

OPTION
? ~ 1906

INPUT
SWITCH

MATCH

INPUT
CUST. INFO.

DISPLAY SWITCH
ENTRY PROMPTS
AND MATCHING
SETTING PROMPTS ~ 1908

DISPLAY CUST.
INFO. ENTRY
PROMPTS

RUN MATCHING
PROCESS USING
SWITCHES and
SETTINGS
ENTERED ~ 1924

RECEIVE INPUTS ~ 1910

RECEIVE INPUTS ~ 1918
~ 1919

DISPLAY
MATCH
RESULTS ~ 1926

MATCH ? ~ 1912   YES

NO

PERFORM
FUNCTION
SELECTED ~ 1914

PERFORM
FUNCTION
SELECTED ~ 1920

EXECUTE
TRANSACTION(S)
~ 1928

RETURN
TO MAIN
MENU
? ~ 1916   NO

RETURN
TO MAIN
MENU
? ~ 1922   NO

CONFIRM
TRANSACTION(S)
~ 1930

YES

YES

FIG. 19

Enter
Dates/
Traits ~2002

Put in table
indexed by dates/
traits ~2004

Pre-processing:
Group by like
dates / traits ~2006

Put all like data or
traits together in
an indexed table ~2008

Search for other
items with that
date/trait with the
opposite interest ~2010

Is there a
match? ~2012

No

Put in indexed "Open"
dates / traits table.
Table is already
indexed for the traits
that do match (such as
near date or far date) ~2016

Yes

Create indexed
match table ~2014

Propose all open
date / trait (those
with only one trait
matched) ~2018

Establish attribute
of proposed trade
that make it a
"good" or
worthwhile trade ~2020

Show proposed
trades that meet
requirement ~2022

FIG. 20

2100

| Switch | B/S | Date/Trait 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|------|---|---|---|---|---|---|---|---|---|----|
| 1 | Buy | N | | | | | F | | | F | |
| 2 | Buy | N | | | | | N | | | | |
| 3 | Sell | N | F | | | | F | | | F | |
| 4 | Sell | N | | | F | | N | | | | |
| 5 | Buy | N | | | | | | | | | |
| 6 | Buy | | | | | | | N | | | |
| 7 | Buy | N | | | N | | | F | | | F |
| 8 | Sell | | | | | | | | | | F |
| Propose | Sell | | | | | | | | | | |

FIG. 21

FIG. 22